

WE CLAIM:

1. A rear projection display system, comprising:
an image source for projecting an image;
a rear reflector; and
a screen configured to display the projected image, wherein the screen includes a plurality of angularly discriminating reflective elements configured to reflect light incident on the screen from a first angle toward the rear reflector, and to allow light incident on the screen from a second angle to be transmitted through the screen for display.
2. The rear projection display system of claim 1, wherein each angularly discriminating reflective element includes a reflective surfaces, each reflective surface being spaced apart from adjacent reflective surfaces.
3. The rear projection display system of claim 2, wherein the reflective surfaces are generally coplanar.
4. The rear projection display system of claim 3, wherein each of the angularly discriminating reflective elements includes a lens positioned adjacent the reflective surface, the lens being configured to direct light incident on the screen from the first angle onto the reflective surface and to direct light incident on the screen from the second angle between adjacent reflective surfaces.

5. The rear projection display system of claim 4, the screen having a height and each lens having a shape, wherein the shapes of the lenses are graduated along the height of the screen.

6. The rear projection display system of claim 2, the screen including a surface having a plane, wherein each of the reflective surfaces is angularly offset with respect to the plane of the screen surface.

7. The rear projection display system of claim 6, the screen having a top and a bottom and each of the reflective surfaces having an angle of offset relative to the plane of the screen surface, wherein the angles of offset of the spaced-apart reflective surfaces change from the top of the screen to the bottom of the screen.

8. The rear projection display system of claim 6, further comprising a casing, wherein the image source is positioned within the casing.

9. The rear projection display system of claim 6, further comprising a casing, wherein the image source is positioned outside of the casing.

10. The rear projection display system of claim 2, the screen including a plurality of vertical pixels, each of the vertical pixels having a height, wherein the reflective surfaces are spaced by a distance equal to or less than the height of the vertical pixels.

11. The rear projection display system of claim 1, wherein the plurality of angularly discriminating reflective elements includes a plurality of prism elements configured to internally reflect light incident on the screen from the first angle toward the rear reflector, and to transmit light incident on the screen from the second direction.

12. The rear projection display system of claim 11, each of the prism elements having a height and the screen having a plurality of pixels, each pixel having a height, wherein the height of the prism elements are less than or equal to the height of the pixels.

13. The rear projection display system of claim 11, wherein each of the prism elements has a generally pyramidal cross-sectional shape.

14. The rear projection display system of claim 1, the screen having a width, wherein each of the angularly discriminating reflective elements extends across the width of the screen.

15. The rear projection display system of claim 1, wherein each of the angularly discriminating reflective elements includes a front side and a back side, the front side being reflective and the back side having a dark coloration for improved contrast.

16. A rear projection display system for displaying an image to a viewer, the rear projection display system having a front side and a back side and comprising:

an image source configured to project an image;

a selectively reflective screen disposed adjacent the front side of the display system, the screen being configured to reflect light incident on the screen from a first angle and to transmit light incident on the screen from a second angle; and

a rear reflector disposed adjacent the back side of the display system, wherein light emitted by the image source is reflected off the selectively reflective screen at least once before being transmitted through the screen.

17. The rear projection display system of claim 16, wherein light emitted by the image source is first reflected by the selectively reflective screen toward the rear reflector, then is reflected by the rear reflector toward the screen at the second angle for transmission through the screen.

18. The rear projection display system of claim 16, wherein the selectively reflective screen includes a plurality of angularly selective reflective elements.

19. The rear projection display system of claim 18, wherein the plurality of angularly selective reflective elements includes a plurality of spaced-apart, reflective surfaces.

20. The rear projection display system of claim 19, wherein the plurality of reflective surfaces are coplanar, and wherein the plurality of angularly selective reflective elements includes a plurality of lens elements configured to direct light incident on the screen from the first angle onto the reflective surfaces and to direct light incident on the screen from the second angle between the reflective surfaces.

21. The rear projection display system of claim 16, wherein the selectively reflective screen includes a total internal reflection element configured to internally reflect incident light from the first angle toward the rear reflector and to transmit incident light from the second angle toward the viewer.

22. The rear projection display system of claim 21, wherein the total internal reflection element includes a prism array.

23. The rear projection display system of claim 21, further comprising a casing, the screen forming a front portion of the casing, wherein the total internal reflection element includes a material of a higher refractive index than the screen filling the casing.

24. A rear projection display system, comprising:
a screen configured to display an image to a viewer;
an image source configured to project the image; and
a rear reflective surface configured to reflect light from the image source onto the screen,

wherein the screen includes a plurality of generally planar, spaced-apart reflective elements such that incident light from a first angle is reflected from the screen toward the rear reflective surface and incident light from a second angle is transmitted between the reflective elements.

25. The rear projection display system of claim 24, the screen having a plane and the reflective elements having generally planar reflective surfaces, wherein the reflective surfaces are angularly offset from the plane of the screen.

26. The rear projection display system of claim 24, the reflective elements having generally planar reflective surfaces, wherein the reflective surfaces are parallel to one another.

27. The rear projection system of 24, the screen having a plane, wherein the reflective elements change angle with respect to the plane of the screen from top to bottom.

28. A rear projection display system, comprising:
an image source;
a rear reflective surface; and
a screen, the screen including a lens array and a mirror array positioned adjacent the lens array, wherein the lens array includes a plurality of lenses configured to direct light incident on the screen from a first angle onto the mirror array to be reflected toward the rear reflective surface, and wherein the screen is configured to direct incident light from a second angle through the mirror array for display to a viewer.

29. A rear projection video system, comprising:

an image source;

a rear reflective surface; and

a screen configured to display an image to a viewer, wherein the screen includes an internal reflection element configured to internally reflect light incident on the screen from a first angle toward the rear reflective surface, and to transmit incident light from a second angle through the screen.

30. The rear projection video system of claim 29, wherein the internal reflection element includes a plurality of prism elements.

31. The rear projection video system of claim 29, the video system including a cabinet and the screen including a flat display portion, wherein the internal reflection element includes a material of a higher index of refraction than the flat display portion filling the cabinet adjacent the flat display portion of the screen.